

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-292147

(43)Date of publication of application : 05.11.1993

(51)Int.Cl. H04L 29/06

H04L 12/28

H04L 12/40

(21)Application number : 04-091086

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(22)Date of filing : 10.04.1992

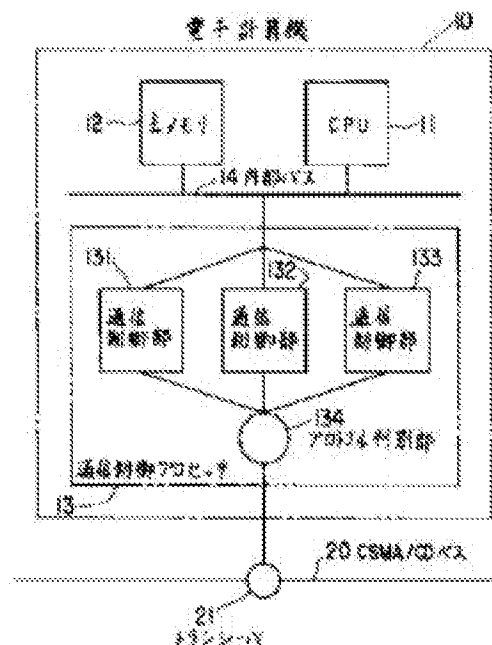
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## (54) COMMUNICATION CONTROL PROCESSOR

### (57)Abstract:

PURPOSE: To implement the communication using plural communication protocols with one communication control processor.

CONSTITUTION: For example, three communication control sections 131-133 implementing specific protocol processing are provided in a communication control processor 13 connected to a CSMA/CD bus 20 via a transceiver 21. When packet data are received from the CSMA/CD bus 20 in the communication control processor 13, a protocol discrimination section 134 provided on the communication control processor 13 references a type field of the packet to discriminate by which protocol the packet is formed. Then the protocol of the packet is processed by the communication control section corresponding to the discriminated protocol among the communication control sections 131-133.



[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the suitable communication control processor for the system by which communication is performed using two or more communications protocols.

[0002]

[Description of the Prior Art] Conventionally, as for the electronic computer, having been constituted as shown in drawing 3 was common in the system with which an electronic computer communicates by a LAN line using two or more communications protocols.

[0003] Namely, the electronic computer 30 in drawing 3 is provided with CPU31 which performs processing of various data processing, an operation, and a communications control protocol, the main memory 32 in which various data, a program, etc. are stored, and communication-control-processor 33-1, 33-2 and 33-3. Interconnection of these CPU31, main memory 32, and communication-control-processor 33-1, 33-2 and 33-3 is carried out by the internal bus 34, and they can perform data transfer now.

[0004] The communication control processor 33-1 to 33-3 is connected to LAN line 40, for example, a CSMA/CD bus, via transceiver 41-1, 41-2 and 41-3. These communication control processors 33-1 to 33-3 have a respectively peculiar MAC (media access control) address.

[0005] Now, the communication control processor 33-1 in the electronic computer 30, For example, it communicates via other terminals and transceivers 41-1 on the CSMA/CD bus 40 using the same protocol by having an interface to a MAC level and performing communications protocol processing of TCP/IP in CPU31.

[0006] Next, the communication control processor 33-2 is supporting the OSI protocol, for example. It communicates via other terminals (OSI terminal) and transceivers 41-2 on the CSMA/CD bus 40 using the same protocol.

[0007] Similarly, the communication control processor 33-3 is supporting the peculiar communications protocol different from the above-mentioned TCP/IP and OSI.

It communicates via other terminals and transceivers 41-3 on the CSMA/CD bus 40 using the same protocol.

[0008]

[Problem(s) to be Solved by the Invention] As described above, in order for an electronic computer etc. to communicate conventionally using two or more communications protocols, The communication control processor which is hardware was needed for every communications protocol, therefore hardware quantity increased, and there was a problem that a MAC Address was [ the number of communication control processors ] moreover needed.

[0009] This invention was made in light of the above-mentioned circumstances, that purpose can respond to performing communication which used two or more communications protocols only by one, and it has it, it can reduce hardware quantity, and, moreover, there is a MAC Address in providing the communication control processor which can be managed with one.

[0010]

[Means for Solving the Problem] This invention is characterized by a communication control processor

comprising the following.

Two or more communication control means which perform peculiar protocol processing.

A protocol discriminating means which distinguishes a communications protocol of packet data received from LAN based on a type field of the data and to which protocol processing of the data is made to carry out by a communication control means peculiar to the protocol.

[0011]

[Function]In the composition of the above-mentioned communication control processor, a protocol discriminating means will distinguish whether it is what those packet data depend on which protocol according to the contents of the type field of those packet data, if packet data are received from LAN in this communication control processor. And a discriminating means passes the packet data to a communication control means peculiar to the protocol distinguished of two or more communication control means, and makes the protocol processing of the data perform.

[0012]Therefore, an electronic computer with the communication control processor of such composition, etc. and each of other terminal which performs communication, Electronic computers which should just communicate against one set of this communication control processor, and communicate regardless of the classification of the communications protocol to be used using two or more communications protocols should just have one communication control processor.

[0013]

[Example]Drawing 1 is a block lineblock diagram showing one working example of the electronic computer which performs communication which used two or more communications protocols by the communication control processor of this invention.

[0014]The electronic computer 10 is provided with CPU11 which performs processing of various data processing, an operation, and a communications control protocol, the main memory 12 in which various data, a program, etc. are stored, and the communication control processor 13 in drawing 1.

Interconnection of these CPU11, the main memory 12, and the communication control processor 13 is carried out by the internal bus 14, and they can perform data transfer now.

[0015]The communication control processor 13 is connected to LAN line 20, for example, a CSMA/CD bus, via the transceiver 21. This communication control processor 13 communicates with the terminal (not shown) corresponding to the various communications protocols on the CSMA/CD bus 20, and has only one peculiar MAC Address. The communication control processor 13 has the three communication control parts 131,132,133 which perform respectively peculiar protocol processing.

[0016]The communication control part 131 communicates via other terminals and transceivers 21 on the CSMA/CD bus 20 using the same protocol by having an interface to a MAC level, for example, and performing communications protocol processing of TCP/IP in CPU11.

[0017]The communication control part 132 supports an OSI protocol, for example, and communicates via other terminals and transceivers 21 on the CSMA/CD bus 20 using the same protocol.

[0018]The communication control part 133 supports a peculiar communications protocol different from the above-mentioned TCP/IP and OSI, and communicates via other terminals and transceivers 21 on the CSMA/CD bus 20 using the same protocol.

[0019]The communication control processor 13 has the protocol discrimination section 134 which distinguishes further the communications protocol of the packet data which the processor 13 received

from the CSMA/CD bus 20. The protocol discrimination section 134 makes a communication control part peculiar to the protocol distinguished among the communication control parts 131-133 perform protocol processing of receiving packet data.

[0020]In this example, the communication control parts 131-133 and the protocol discrimination section 134 are functional blocks realized by firmware processing of the communication control processor 13.

[0021]Next, operation of the composition of drawing 1 is explained. First, if the communication control processor 13 in the electronic computer 10 receives packet data with a MAC Address peculiar to self from the CSMA/CD bus 20 via the transceiver 21, the receive packet will be passed to the protocol discrimination section 134 in the communication control processor 13.

[0022]Refer to the type field of this receive packet for the protocol discrimination section 134. The information which shows with which protocol the corresponding packet is communicating is set to this type field. Then, the protocol discrimination section 134 distinguishes whether the packet is what is communicating with which protocol based on the type field of a receive packet.

[0023]And the protocol discrimination section 134 will pass the packet to the communication control part 131 in the communication control processor 13, if a receive packet is based on TCP/IP, and if based on an OSI protocol, it will pass the packet to the communication control part 132. The protocol discrimination section 134 will pass the packet to the communication control part 133, if a receive packet is based on predetermined communications protocol with another TCP/IP and OSI protocol.

[0024]The communication control part passed the receive packet from the protocol discrimination section 134 among the communication control parts 131-133 processes the receive packet with the protocol which self is supporting. Since it is only having an interface to a MAC level, the communication control part 131 in this example is performed by CPU11 about the protocol processing by TCP/IP of the higher rank according to the program stored in the main memory 12.

[0025]Thus, each communication control parts 131-133 are started according to the protocol discriminated result of the protocol discrimination section 134, and communicate with other terminals on the CSMA/CD bus 20 corresponding to the communications protocol by performing respectively peculiar protocol processing. Under the present circumstances, other terminals should be just conscious of the communication control processor 13 (only one MAC Address) in the electronic computer 10, and are not conscious of the communication control parts 131-133 at all.

[0026]Although said working example explained the case where three sorts of communications protocols were supported by the communication control processor 13, it does not restrict to this. That is, the number of protocols and protocol kind which are supported by the communication control processor 13 are not restricted to said working example.

[0027]Although said working example explained as that to which communication of two or more protocols is performed via the CSMA/CD bus 20, It can apply also to the communication using LAN other than CSMA/CD buses, such as a token bus, and also can apply not only to bus formed LAN but to the communication using ring formed LAN.

[0028]

[Effect of the Invention]As explained in full detail above, in this invention, two or more communication control means which perform respectively peculiar protocol processing are established in one communication control processor, The communication control processor distinguished the communications protocol of the packet data received from LAN based on the type field of the data by

the protocol discriminating means, and had composition to which the protocol processing of the data is made to carry out by a communication control means peculiar to the protocol.

Therefore, though it is one communication control processor, communication using two or more communications protocols can be performed, hardware quantity can be reduced, and moreover, a MAC Address can be managed with one.

## TECHNICAL FIELD

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[Industrial Application] This invention relates to the suitable communication control processor for the system by which communication is performed using two or more communications protocols.

[Claim(s)]

[Claim 1] A communication control processor comprising:

Two or more communication control means which perform peculiar protocol processing.

A protocol discriminating means which distinguishes a communications protocol of packet data received from LAN based on a type field of the data and to which protocol processing of the data is made to carry out by said communication control means peculiar to the protocol.

## PRIOR ART

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[Description of the Prior Art] Conventionally, as for the electronic computer, having been constituted as shown in drawing 3 was common in the system with which an electronic computer communicates by a LAN line using two or more communications protocols.

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